RECEIVE LOGIC UNIT (RLU), 628025

GENERAL DESCRIPTION

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1. GENERAL

1.01 This Section provides a general description of the ITT D448 receive logic unit (RLU), 628025 (Fig. 1), to the functional block diagram level.

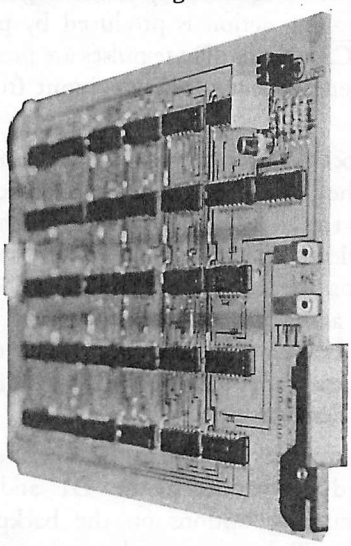


Fig. 1—RLU, 628025

1.02 Whenever this Section is reissued, the reasons for reissue will be listed in this paragraph.

1.03 The RLU receives companded pulse code modulation (PCM) from the distant multiplex terminal, via the line interface (LI-) unit; demultiplexes the individual channel information; and extracts timing and framing data from the PCM. The RLU provides reframing functions and generates system test codes (1 kHz and quiet).

2. DESCRIPTION

2.01 The unit mounts in the D448 multiplex shelf (common equipment mounting section) in connector J10C (for Digroup A) or J13C (for Digroup B). Installation procedures for the unit are provided in Section ITTR-18-431 (for Mode 1 operation), ITTR-18-432 (for Mode 2 operation), or ITTR-18-433 (for Mode 3 operation).

2.02 The unit is available in Group -0 only.

2.03 The unit consists of an epoxy-glass printed circuit board (PCB) and associated circuit components. The lower front edge of the PCB is fitted with a handle to facilitate insertion and removal of the unit from the shelf. An identification strip on the handle face indicates the unit mnemonic (RLU), last three digits of the model number, last three digits of the part number, and issue letter. The part number and issue letter are also located on the component side of the PCB.

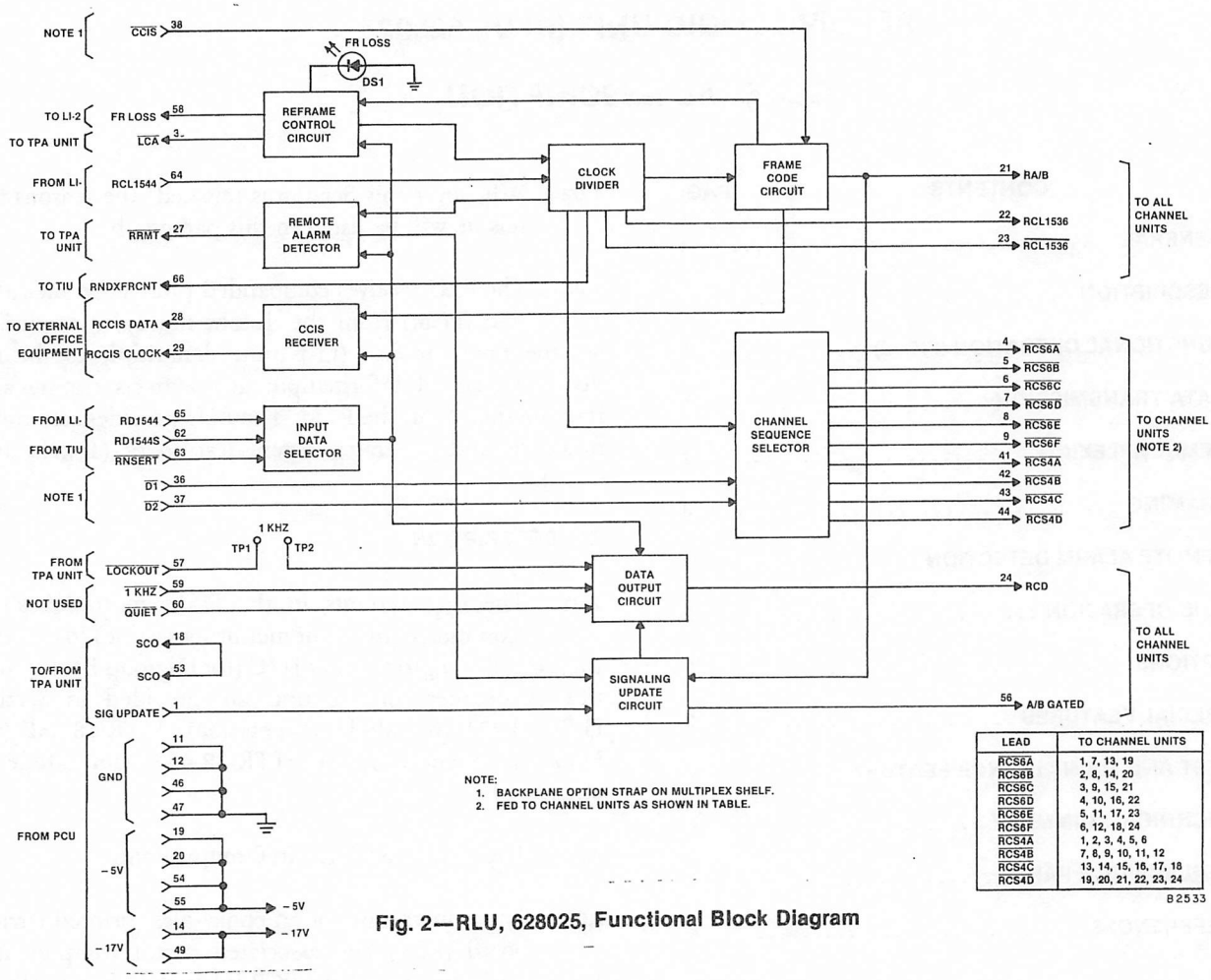
2.04 The FR LOSS LED (DS1) and the 1 KHZ test points (TP1 and TP2) are located on the front edge of the PCB.

2.05 Printed circuit wiring is etched on both sides of the PCB. The unit inputs and outputs are terminated in gold-plated contacts on the rear edge of the PCB. These contacts mate with a 70-pin contact edge connector on the rear of the multiplex shelf.

3. FUNCTIONAL OPERATION (FIG. 2)

DATA TRANSMISSION

3.01 Unipolar data from the LI- is applied to the input data selector on the RD1544 lead. During normal



NOTE:
1. BACKPLANE OPTION STRAP ON MULTIPLEX SHELF.
2. FED TO CHANNEL UNITS AS SHOWN IN TABLE.

LEAD	TO CHANNEL UNITS
RCS6A	1, 7, 13, 19
RCS6B	2, 8, 14, 20
RCS6C	3, 9, 15, 21
RCS6D	4, 10, 16, 22
RCS6E	5, 11, 17, 23
RCS6F	6, 12, 18, 24
RCS4A	1, 2, 3, 4, 5, 6
RCS4B	7, 8, 9, 10, 11, 12
RCS4C	13, 14, 15, 16, 17, 18
RCS4D	19, 20, 21, 22, 23, 24

B 25 33

Fig. 2—RLU, 628025, Functional Block Diagram

operation, the input data selector passes this data for processing. However, when the test interface unit (TIU) sets the RNSERT lead low, the input data selector passes data from the automated test and alignment unit (ATAU). This data consists of only one channel word and then RNSERT is set high and normal transmission resumes.

3.02 The output of the input data selector is routed to the reframe control circuit, remote alarm detector, and common channel interoffice signaling (CCIS) receiver for various functions (described in the following paragraphs). The main transmission path is to the data output circuit. During normal operation, the data output circuit buses the data to the channel units on the RCD bus. If the 1 KHZ or QUIET leads are set low, the associated digital code for 1 kHz or quiet is bused to all the channel units. These leads can be strobed to allow application of the associated signal to only one channel at a time. Additionally, if the LOCKOUT lead from the trunk processor and alarm (TPA) unit is set low and a shorting plug is inserted in the 1 KHZ test points on the front edge of the RLU, the data output circuit buses digital 1 kHz to all the channel units. Either of these two methods can be used for sending the codes to any number of channel units because of the busing of the output data and the strobing action of the RLU (Para. 3.03 through 3.05).

DEMULTIPLEXING

3.03 The data applied to the channel units on the RCD bus is demultiplexed by a strobing action of the RLU. The strobing action is produced by pulses on the RCS6 and RCS4 leads. These pulses are produced by the channel sequence selector with an input from the clock divider.

3.04 The clock divider receives a 1.544-MHz clock signal from the LI- and pulses the channel sequence selector to identify the 24 channel word times. When pulsed by the clock divider, the channel sequence selector places strobe pulses on one RCS6 lead and one RCS4 lead. The channel unit associated with those leads is gated on to accept one 8-bit word for decoding. The channel unit clocks in the data under control of a 1.536-MHz clock produced by the clock divider.

3.05 The sequence in which the channel units are sampled is controlled by the D1 and D2 leads, which are strapping options on the backplane of the multiplex shelf. With neither of the options strapped, the channel units are sampled in the D3 sequence. With one

of the options strapped, the channel units are sampled in the appropriate sequence as selected (D1D or D2).

FRAMING

3.06 The frame code circuit generates a duplicate framing code and sends it to the reframe control circuit. The reframe control circuit compares the duplicate framing code with the framing code extracted from the incoming data.

3.07 If the reframe control circuit detects that the incoming frame code is out of synchronization with the duplication framing code (out-of-frame condition), it turns on the FR LOSS indicator, sends a signal to the TPA unit on the $\overline{\text{LCA}}$ bus to cause a local alarm, and inhibits the clock divider for one bit at a time to allow alignment with the proper framing code. After the reframe control circuit has successfully reframed, it turns off the FR LOSS indicator and removes the local alarm signal to the TPA unit. When the unit is properly in frame, it signals the LI-2 (Mode 2 operation only) on the FR LOSS lead.

REMOTE ALARM DETECTION

3.08 The remote alarm detector checks for the suppression of bit 2s in the incoming data. If this occurs, indicating a local alarm at the far-end terminal, the remote alarm detector sends a signal to the TPA unit on the $\overline{\text{RRMT}}$ lead to cause a remote alarm. After remote alarm initiation, the signaling update circuit restores bit 2s in the outgoing data.

3.09 This signaling state storage is accomplished as follows. During normal operation, the A/B GATED lead switches. This allows the channel units to gate and process signaling information present in the 8-bit channel words. During a local alarm condition, A/B GATED is stopped in its present state by the signaling update circuit. This forces the channel units to store their present signaling information and be inhibited from gating and processing new signaling information.

3.10 As mentioned, signaling state storage occurs during local alarms. During a local alarm, the TPA unit sets the SIG UPDATE lead high, causing the signaling update circuit to set the A/B GATED lead low.

CCIS OPERATION

3.11 When the terminal uses CCIS, the CCIS receiver removes the CCIS data and clock from the input bit stream and applies it to the external office equipment.

4. OPTIONS

4.01 This unit has no field-selectable options. However, there are options on the backplane of the multiplex shelf which affect the operation of this unit. Refer to Section ITTR-18-405 for option selection information on these options.

5. SPECIAL FEATURES

5.01 The RLU provides the circuitry necessary for signaling state storage on the channel units. This enables the channel units to remain in either a busy or idle condition during the initiation of a carrier group alarm (CGA) condition.

5.02 If the RLU is removed from the multiplex shelf while the terminal is in service, a local alarm will occur. The SCO loop on the unit is fed to the TPA unit and if that loop opens, the TPA unit causes a local alarm.

5.03 Digital 1-kHz code can be bused to all the channel units during an alarm condition by inserting a shorting plug in the 1 KHZ test points.

6. TEST AND MAINTENANCE FEATURES

6.01 A description of the test and maintenance features of the unit is provided in Table A. Refer to Fig. 1 for the physical location of these features.

TABLE A

FEATURE	REF. DES.	FUNCTION
FR LOSS LED (red)	DS1	When on, indicates a failure to synchronize with incoming data.
1 KHZ test points	TP1 and TP2	The insertion of a shorting plug into the test points sends a digital 0 dBm0 signal to all channel units; the terminal must be in a CGA condition for this to occur.

7. TECHNICAL SUMMARY

7.01 A summary of the technical specifications for the unit is given in Table B.

TABLE B

ITEM	SPECIFICATION
POWER REQUIREMENTS	
Voltage Current	−5 ±0.25 Vdc 675 mA maximum
OPERATING ENVIRONMENT	
Temperature Humidity Altitude	0° to 55°C To 95% at 40°C (no condensation) To 14,000 ft (4,267 m)
DIMENSIONS	
Height Width Depth	5.0 in. (12.7 cm) 0.5 in. (1.3 cm) 9.6 in. (24.4 cm)
WEIGHT	0.4 lb (0.2 kg)

8. REPLACEABLE PARTS

8.01 This unit has no field-replaceable parts.

9. REFERENCES

9.01 The engineering drawings noted in Table C were used in the preparation of this Section.

TABLE C

TYPE	DRAWING NO.
Assembly Schematic	628025-000 628025-002

9.02 Related information on the RLU may be found in the ITTR Sections referenced in Table D.

TABLE D

TITLE	SECTION NO.
Connectorized Multiplex Shelf (MS/WC7, MS/WC5, MS/C7 and MS/C6), 628001, 628005, 628011 and 628015 — General Description	ITTR-18-005
Connectorized Multiplex Shelf (MS/WC7, MS/WC5, MS/C7 and MS/C6), 628001, 628005, 628011 and 628015 — Option Selection, Installation and Pretest	ITTR-18-405
Mode 1 Common Equipment — Installation and Pretest	ITTR-18-431
Mode 2 Common Equipment — Installation and Pretest	ITTR-18-432
Mode 3 Common Equipment — Installation and Pretest	ITTR-18-433